TOGICAL
. F. W. S.
#579

Fishery Leaflet

#579

Castnets Constructed of Machine-Made Netting

by Hilton M. Floyd

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

Fishery Leaflet 579

CONTENTS

	Page
Introduction	1
Castnet styles	1
Designs and methods	2
Gore net	2
Skirt net	2
Style construction	6
English net	6
Spanish net	9
Summary	13

UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, *Secretary*

John A. Carver, Jr., *Under Secretary*

Stanley A. Cain, *Assistant Secretary for Fish and Wildlife*

FISH AND WILDLIFE SERVICE, Clarence F. Pautzke, *Commissioner*

BUREAU OF COMMERCIAL FISHERIES, Donald L. McKernan, *Director*

Washington, D.C. July 1965

Castnets Constructed of Machine-Made Netting

by

HILTON M. FLOYD

Fishery Methods and Equipment Specialist
Bureau of Commercial Fisheries Exploratory Fishing
and Gear Research Base
Pascagoula, Miss.

Castnet fishing has been practiced by commercial and sport fishermen for centuries in many parts of the world. This method was probably introduced to the new world by the first settlers during the sixteenth century. In the past two decades, it has become increasingly popular in the southeastern United States.

The castnet is a circular piece of netting with lead weights secured around the perimeter, which is tucked under to form a pocket and has a rope rigged to the center for retrieving.

The net can be cast over fish by a fisherman wading in shallow water, or may be cast from shore, dock, or boat. To spread the net perfectly requires a great amount of practice and patience by the fisherman. Judging the speed and direction of travel of a fish when it whirls the water in the fisherman's vicinity is an art. This is why castnet fishing attracts the sportsmen.

Castnet fishing is done the year round and many species of fish are taken; the most popular fish in the southeastern United States is mullet.

The art of hand knitting a castnet has been handed down from father to son and requires a great amount of skill and time. The purpose of this paper is to describe the two simpler methods of constructing a castnet from machine-knitted netting. They greatly reduce the construction time.

The netting can be made of linen, silk, cotton, or nylon and other synthetic materials. Though cotton netting requires more care (thorough washing and drying before storing) than synthetic materials, in many instances it outlasts them, since it does not cut or chafe as easily on shelly or rocky bottom. The mesh size, size of twine, and length of net depend on the species of fish to be caught and the preference of the fisherman. However, the popular size is a 6-foot net constructed of 2-inch stretched-mesh, No. 20/9, cable-laid cotton twine, or No. 208 nylon twine. For catching shrimp or small bait fishes, the mesh size can be reduced.

The following instructions and illustrations are presented in a step-by-step manner. To make them easily understood by a fisherman, I chose a 6-foot castnet with 2-inch stretched-mesh. With a little calculation, however, he can alter the instructions and use them for any size of mesh or length of net.

Because of the lack of standardization in measuring twine, the fisherman may have a problem in purchasing the size he desires. The No. 20/9 cable-laid cotton twine and No. 208 nylon twine mentioned in this paper have about 0.0224-inch diameter. The breaking strength of the 20/9 cotton is 10.5 pounds and of the 208 nylon is 28 pounds.

CASTNET STYLES

The Spanish and English styles of castnets are commonly used. The Spanish net has the weighted perimeter folded under to form a pocket and secured to the netting at regular intervals with short tucks (or brails), usually of 18-thread (about 1/16-inch diameter) twine. The handline is secured to the center of the circle. When the trapped fish tries to escape from under the net, which has been cast over it, it swims into the pocket. This style of net should always be used in shallow water so that it can settle on the bottom. After being cast over the fish it should be hauled in slowly to prevent the leads from being pulled off the bottom, allowing the fish to escape.

The English net has tucks (or brails), usually of 18-thread twine, several inches longer than the radius of the circle. These tucks are secured at regular intervals to the weighted perimeter on the underside of the net and pass through the horn (a ring or grommet in the center of the net), and are secured to the handline. After being cast, this net should be hauled in quickly so that all the perimeter will come together in a bunch and the horn will slide down the tucks, forming a pocket or sack of the entire netting and trapping the fish. This net is much more effective in shallow water because it touches bottom, but

it is also effective in deep water without touching bottom. In deep water, as soon as the net settles over the fish, it must be hauled in quickly. The English net therefore has a distinct advantage over the Spanish net because it can be used in both shallow and deep water. Because of the long tucks, however, it tangles more easily than the Spanish net.

DESIGNS AND METHODS

I shall now deal with the two methods of making a disk from machine-made netting: (1) The gore net method and (2) the skirt net method. There is no difference in the performance of the gore net and the skirt net, but the skirt net is more easily constructed than the gore net, since it does not have tapered seams. However, a person experienced in working with tapered netting can construct a gore net in less time than he can construct a skirt net because there are fewer knots to be tied. The materials can be purchased from most commercial fishermen suppliers. If nylon netting is used, all the loose twine ends should be melted to prevent unraveling and opening the knots (a lighted cigarette can be used). Also, all knots should be doubled to prevent them from slipping.

Gore Net Method

The body of the gore net is constructed by sewing eight tapered (wedge-shaped) sections (gores) together, forming a disk of netting (fig. 1A). The sections are cut from machine-knitted netting (fig. 1B).

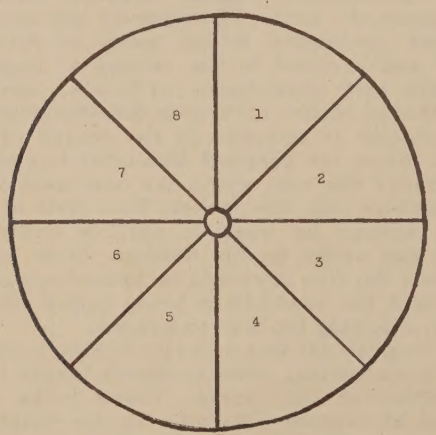


Figure 1A.--Gore net layout.

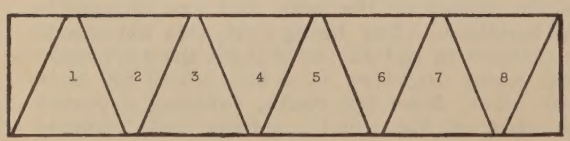


Figure 1B.--Layout of netting cuts.

The materials needed for constructing a gore net are:

One piece of cotton netting, 180 meshes long by 36 meshes deep of 2-inch stretched-mesh, No. 20/9 cable-laid twine.
One-quarter pound of No. 20/9 cable-laid cotton twine.
One medium-size net needle.
A sharp knife or scissors.

Now the eight gores are ready to be cut, and figure 2 can be used as a guide in cutting out the eight gores.

After the eight gores are cut out, the most time-consuming part of constructing the net begins--sewing the gores together to form a disk. This is where a net needle (fig. 3) is used. The needle is a simple tool for holding the twine while the sewing is being done and is pointed on one end so that it can easily pass through the desired mesh. Near the pointed end is the tongue; the opposite end has the fork. To fill the net needle, take several turns around the base of the tongue with the end of the sewing twine (No. 20/9 cable-laid cotton); wind the twine down the side, around the fork, up the opposite side, then around the tongue, and back to the other side. Continue the winding until the needle is full. Wind the twine on the needle tightly and make sure the needle is not too full to pass freely through the meshes. Figure 4 shows the steps to be followed in sewing the gores together. One helpful point to remember is that after the first two knots are tied, every knot then forms a four-sided mesh; that is, a mesh having four equal sides with a knot in each corner. Any mesh with more or less than four sides is a mistake.

A sheet or becket bend (fig. 5) is used in sewing the sections of netting together. In making each knot, the sewing twine is knotted in the corner of a mesh. The knots and ends of twine on the meshes of the cutout sections do not affect the performance of the castnet.

All eight sections of netting are sewed together as described in figure 4. Now the body of the gore net is completed.

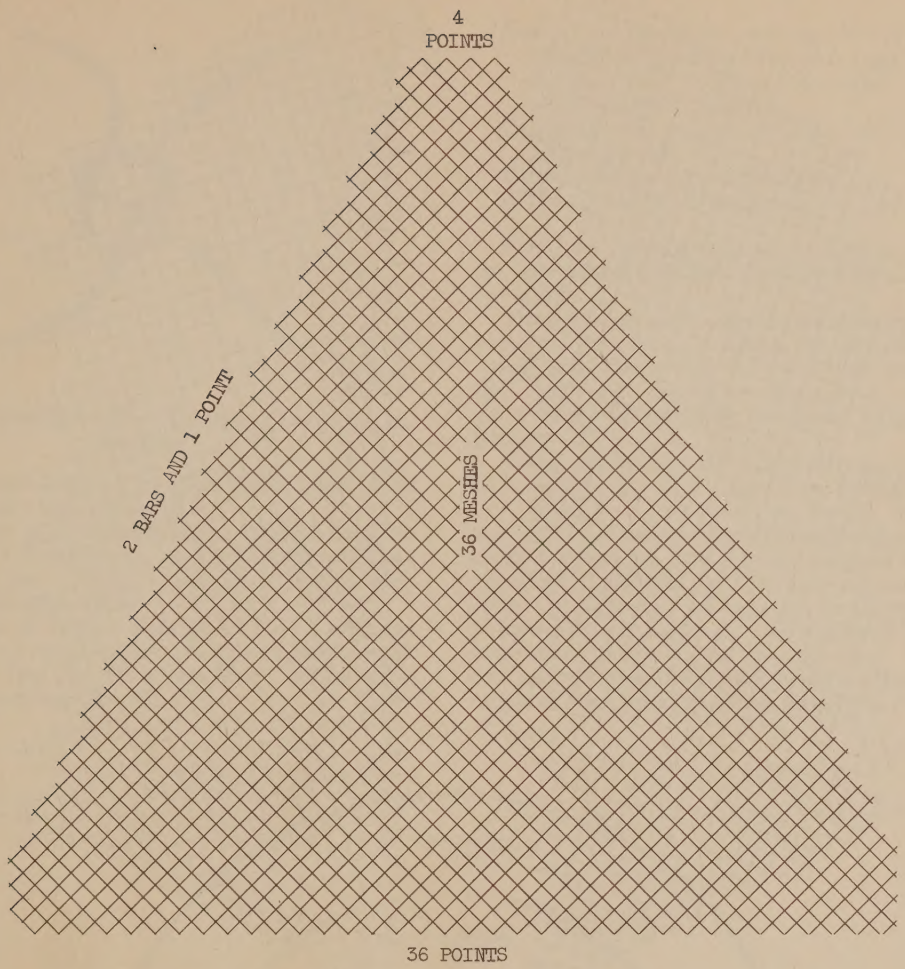
Skirt Net Method

The body of the skirt method is constructed by sewing four skirts (cylindrical-shaped sections) of netting together, forming a disk when spread out flat (fig. 6).

The number of meshes are increased in each skirt from the center outward. There are no tapered seams in the skirt net; therefore, it is easier to construct than the gore net.

The materials needed for constructing a skirt net are:

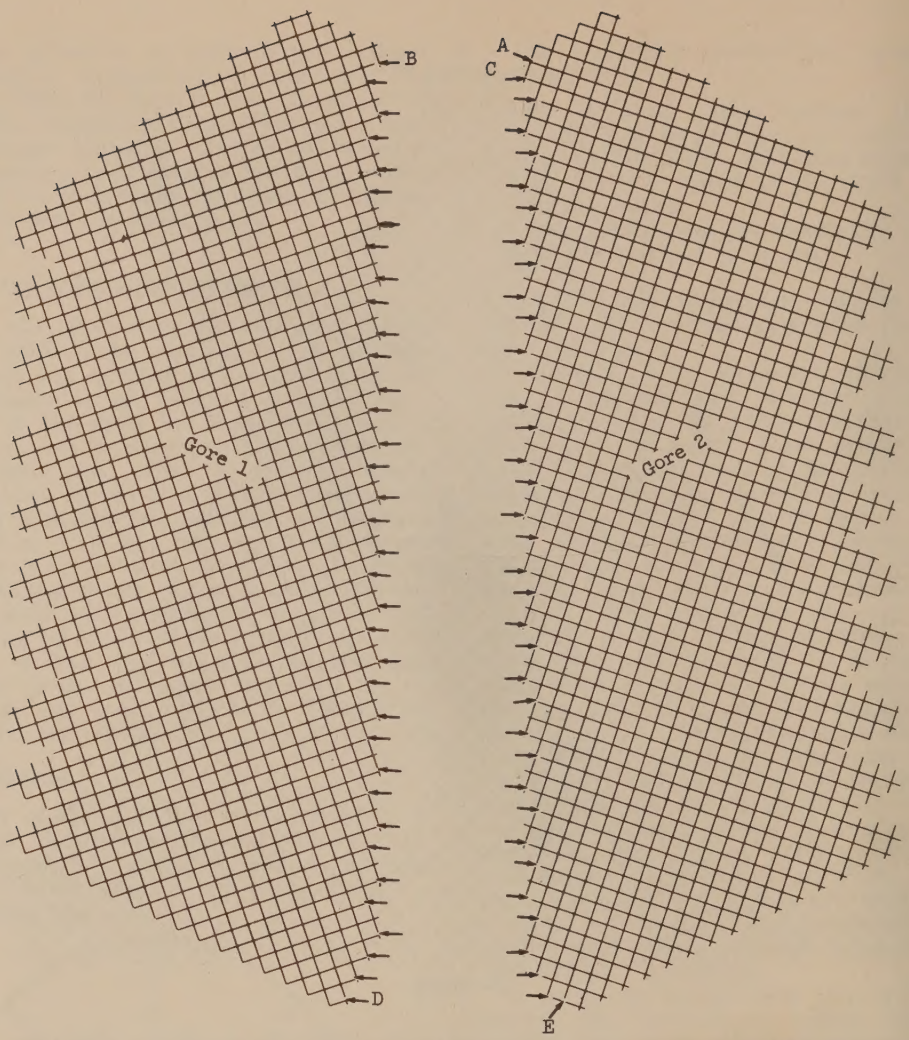
One piece of cotton netting, 49-1/2 meshes long by 4 meshes deep (wide) of 2-inch



Spread the netting out on a flat surface and use this illustration as a guide in cutting out the eight sections. Note figure 1B for layout of netting cuts. Cut the netting exactly as shown here.

Figure 2.--Section of gore net.

Figure 3.--Net needle.



All knots are tied in the corner of the meshes as indicated by an arrow. A study of figure 5 will simplify the knot tying. Tie the end of the sewing twine (20/9 cable-laid cotton) on at point A, leaving 2 inches of sewing twine, then tie on at point B. Next tie on at point C, leaving 1 inch of sewing twine between knots B and C. Leave 1 inch of sewing twine between all knots from B to D. Leave 2 inches of sewing twine between knots D and E (the finishing point).

NOTE: Two knots are never made in succession on the same gore. The sewing twine zigzags from gore 1 to gore 2 and so on. Gore 3 is sewed to gore 2 the same as gore 2 is sewed to gore 1 and so on until gore 8 is sewed to gore 1. Then the disk of netting is completed.

Figure 4.--Sewing guide for gore net.

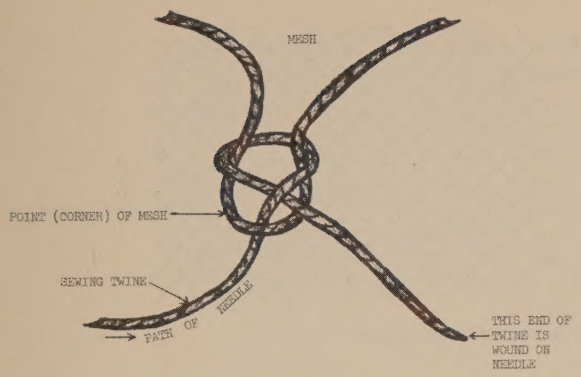


Figure 5.--Sheet or becket bend used for sewing netting together.

stretched-mesh, No. 20/9 cable-laid twine (for skirt number one).

One piece of cotton netting, 99-1/2 meshes long by 10 meshes deep of 2-inch stretched-mesh, No. 20/9 cable-laid twine (for skirt number two).

One piece of cotton netting, 199-1/2 meshes long by 10 meshes deep of 2-inch stretched-mesh, No. 20/9 cable-laid twine (for skirt number three).

One piece of cotton netting, 299-1/2 meshes long by 10 meshes deep of 2-inch stretched-mesh, No. 20/9 cable-laid twine (for skirt number four).

One-quarter pound of No. 20/9 cable-laid cotton twine.

One medium-size net needle.

A sharp knife or scissors.

Now the netting can be sewed together, and the net needle filled as described in the gore net section.

The ends of each section of netting are sewed together to form a skirt (or tubular shape), using the same knot (sheet bend) described in the gore net section. Figure 7 will serve as a guide in sewing the ends of netting together.

After the ends of each netting section have been sewed together, the four skirts are ready for sewing together to form the disk. Since the skirts increase in circumference from the center outward, the extra meshes have to be gathered (picked up) in the seams. This is done by passing the sewing twine through the points of two meshes and knotting at regular intervals. Figure 8A shows how the skirts are sewed together, and figure 8B shows how to gather or pick up extra meshes.

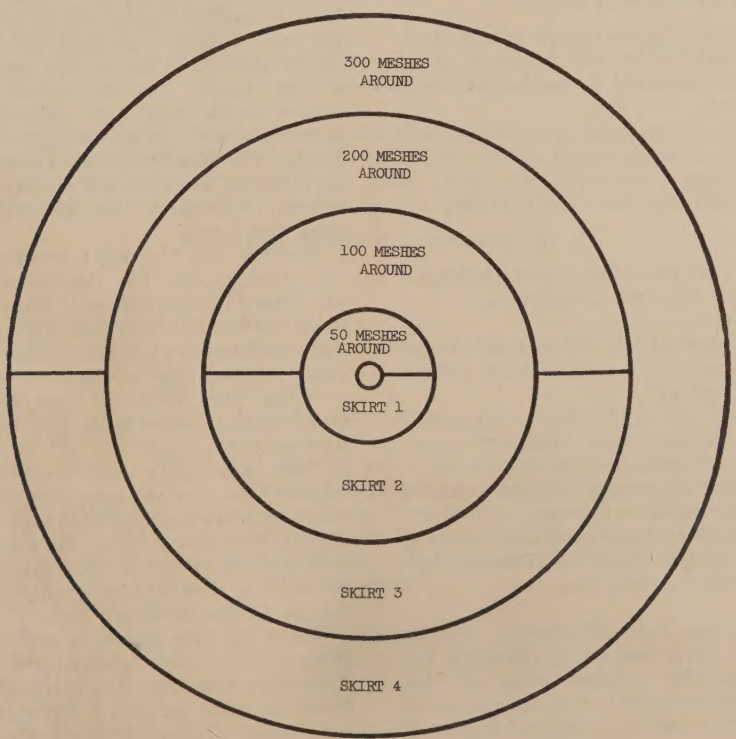
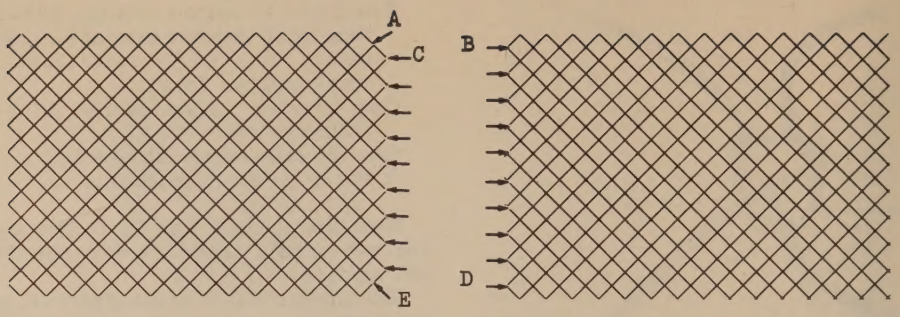


Figure 6.--Skirt net layout.



All knots are tied in the corner of the mesh as indicated by an arrow.

Tie the end of the sewing twine (20/9 cable-laid cotton) on at point A leaving 2 inches of sewing twine, then tie on at point B. Next, tie on at point C, leaving 1 inch of sewing twine between knots B and C. Leave 1 inch of sewing twine between all knots from B to D. Leave 2 inches of sewing twine between knots D and E (the finishing point).

NOTE: Two knots are never made in succession on the same side of the seam. Make sure there are no twists in the netting before sewing the ends together.

Figure 7.--Method of sewing the ends of netting together.

This completes the gore and skirt net methods of constructing a disk of netting from machine-knitted netting.

STYLE CONSTRUCTION

When a disk of netting has been completed, now either the English or the Spanish style castnet can be completed. I shall deal with the English net first.

English Net

The materials needed for constructing an English net are:

- Twenty feet of 1/4-inch diameter medium-laid cotton rope (for the handline).
- One castnet horn.
- One hundred ten feet of No. 18-thread (about 1/16-inch diameter) medium-laid cotton twine (for the tucks).
- Thirty-four feet of 5/32-inch diameter medium-laid cotton rope (for the leadline).
- One hundred fifty 1-ounce castnet leads (148 for gore net).
- No. 20/9 cable-laid cotton twine (for sewing leadline to netting). There will be enough sewing twine left for this job.

Cut a piece of the No. 18-thread cotton twine 1 foot long, then weave it through all the meshes around the center edge of the netting. Tie this twine tightly around the horn and cut off the excess ends. Study of figure 9 will simplify this job.

Now the castnet is ready for hanging-in (attaching the leadline). String all the leads onto the 5/32-inch diameter cotton rope. To prevent the end of the rope from fraying while passing it through the leads, wrap tightly with thin adhesive tape. Also, dry soap rubbed on the end of the rope will act as a lubricant and allow the leads to slip on easily.

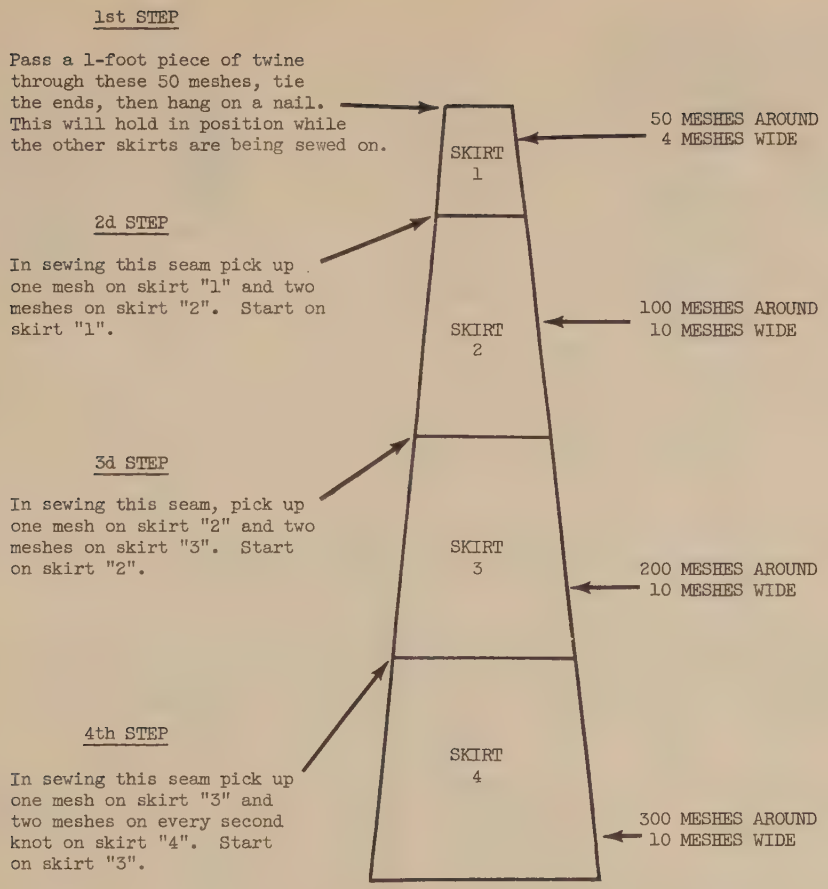
The leads recommended for use weigh 1 ounce each and are spaced at every other mesh around the perimeter of the net. Castnet leads are available in various sizes and can be spaced to suit the fisherman. The heavier a net is leaded, the quicker it will sink and trap the fish.

Double the No. 20/9 sewing twine and use it for hanging-in the leadline. Fill the needle as described earlier. The hanging twine is secured to the netting by a sheet bend and to the leadline by a clove hitch (fig. 10). Consult figure 11 on how to hang-in the leadline.

After the leadline has been hung-in, the final phase, attaching the tucks and handline, comes next.

The use of a 1-1/2-inch trolling swivel where the tucks join the handline helps to reduce twisting of the tucks. The tucks are attached in one end of the swivel and the handline in the other. Some fishermen do not like to use a swivel because it will sometimes tangle in the netting.

Make an eye splice in one end of the 20-foot length of 1/4-inch cotton rope, leaving a 1-inch diameter eye (fig. 12). Suspend this eye splice from a nail or hook about 6 feet high. Next cut eight 13-foot lengths of 18-thread cotton twine. Then pass these eight pieces of twine


1st STEP
Pass a 1-foot piece of twine through these 50 meshes, tie the ends, then hang on a nail. This will hold in position while the other skirts are being sewed on.
50 MESHES AROUND
4 MESHES WIDE
SKIRT 1
2d STEP
In sewing this seam pick up one mesh on skirt "1" and two meshes on skirt "2". Start on skirt "1".
100 MESHES AROUND
10 MESHES WIDE
SKIRT 2
3d STEP
In sewing this seam, pick up one mesh on skirt "2" and two meshes on skirt "3". Start on skirt "2".
SKIRT 3
200 MESHES AROUND
10 MESHES WIDE
4th STEP
In sewing this seam pick up one mesh on skirt "3" and two meshes on every second knot on skirt "4". Start on skirt "3".
SKIRT 4
300 MESHES AROUND
10 MESHES WIDE

All knots are tied in the point of a mesh except where gathering is done, and then the sewing twine (No. 20/9 cable-laid cotton) is passed through the points of two meshes and knotted. A study of figure 4 will simplify the knot tying. Leave 1 inch of sewing twine between all knots. The seam is finished at the point it is started.

Figure 8A.--Sewing guide for skirt net.

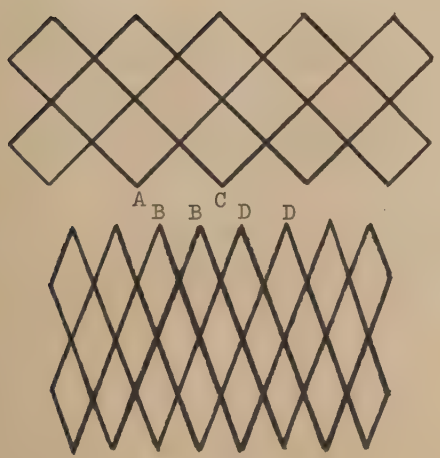


Figure 8B.--How to gather meshes.

Tie the end of the sewing twine on at point A, then pass the sewing twine through points B and knot, then to point C and back to points D, and so on until the skirt is sewed on all the way around. If no gathering of meshes is to be done, such as in the case of sewing the bag on the Spanish net, pick up only one mesh on each piece of netting and sew as described above.

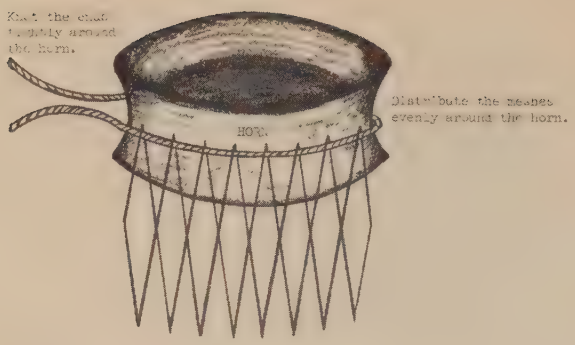
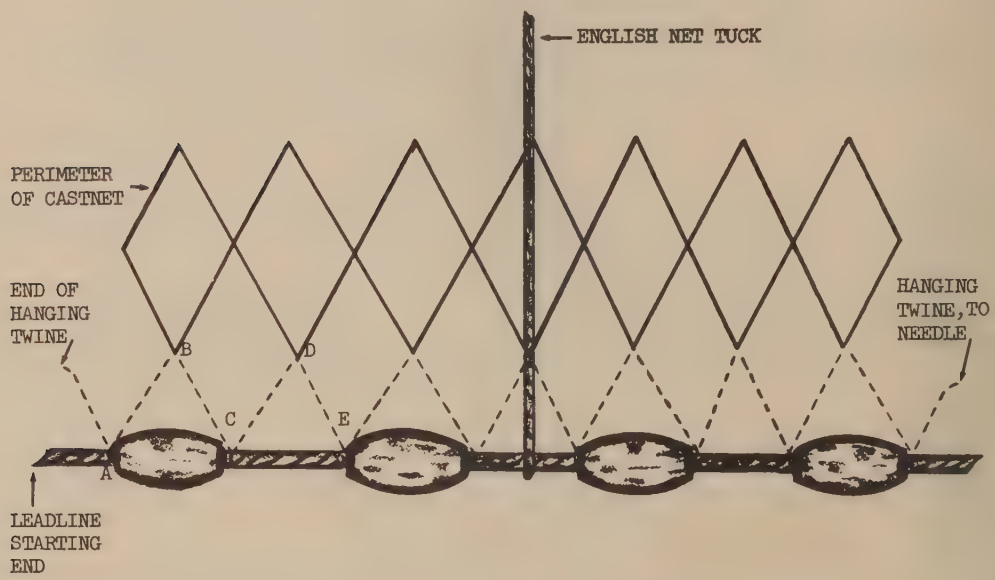


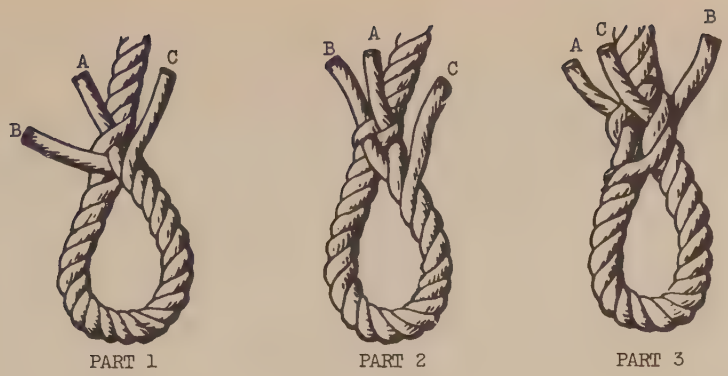
Figure 9.--Method of attaching the center of the netting to the horn.

Figure 10.--Clove hitch.



Tie hanging twine on at point A, using clove hitch (fig. 10), then pass through mesh at point B, leaving 1 inch of hanging twine, then tie sheet bend, next to points C and D, and so on around the net. Leave 1-3/8-inch distance between the clove hitches around the leadline. Leave 1 inch of leadline between starting end and point A. Leave 1 inch of leadline after tying the last clove hitch. Join the starting end and finish end of leadline by overlapping 1 inch, then secure by tying a series of clove hitches around the overlapped ends. After tying the hanging twine in the last mesh point, tie it then to the starting end of the hanging twine and the hanging-in is completed.

Figure 11.--Method of attaching English net tucks and perimeter of netting to the leadline.



The rope is unlaid for about 6 inches from the end, and the strands brought back upon the standing part of the rope at a point which will form an eye of the desired size.

Hold the rope in position as illustrated, with middle strand (A), up with a strand directly under it. Have eye towards you. Carry out the tucks as follows: (Part 1) Tuck strand (A) under the strand below it. Next, bring strand (B) over the strand which (A) was tucked under and tuck under the next one. (Part 2) Now turn the splice around to the opposite side. (Part 3) Making sure that strand (C) is tightly twisted with the lay, tuck it under the last strand. All the tucks are made from right to left. After all the strands have been tucked once, repeat the tucks over and under two more times and the splice is finished.

Figure 12.--Eye splice.

one-half their length through the eye in the end of the 1/4-inch cotton rope. Now there are 16 6-1/2-foot tucks hanging in the eye in the end of the handline. To secure the tucks, use a 1-foot length of No. 18-thread twine and make several tight clove hitches around them all as close to the 1/4-inch rope as possible, then cut off the excess ends. Next, pass the ends of the tucks through the horn into the inside (or underside) of the castnet and slide the horn up to a point 2 inches from the eye splice. Temporarily lash the horn in this position for convenience in working. Now, using 4 inches of the end of each tuck, tie it to the leadline, using two clove hitches as close together as possible. Then twist open the cotton rope and pass the end of the tuck through, pull snug, and cut off the excess end. All 16 tucks are evenly spaced around the leadline. Make sure the tucks are not twisted around each other before tying them to the leadline. (See tuck in fig. 11.) Next, make an eye splice in the other end of the handline, leaving a 1-inch diameter eye. This eye is for making a loop to put around the fisherman's wrist. The English net is completed.

Spanish Net

The materials needed for constructing a Spanish net are:

- Twenty feet of 1/4-inch diameter medium-laid cotton rope (for the handline).
- Sixty feet of No. 18-thread medium-laid cotton twine (for the tucks).
- Thirty-four feet of 5/32-inch diameter medium-laid cotton rope (for the leadline).
- One hundred fifty 1-ounce castnet leads (148 for gore net).
- No. 20/9 cable-laid cotton twine (for sewing on bag and sewing leadline to netting). There will be enough sewing twine left for this job.
- One piece of 295-1/2 meshes long by 16 meshes deep (for the gore net) or 299-1/2 meshes long by 16 meshes deep (for the skirt net) or 2-inch stretched-mesh, No. 6 (0.0291-inch diameter) medium-laid twine cotton netting (for the bag).
- Three feet of No. 6 medium-laid cotton twine (for sewing the ends of the bag together).

Pass one end of the 1/4-inch rope through all the meshes around the center edge of the disk of netting. Now make an eye splice in this end of the rope, leaving a 1-inch diameter eye (fig. 12). This secures the body of the castnet to the handline. Next, make an eye splice in the other end of the handline, leaving a 1-inch diameter eye. This eye is for making a loop to put around the fisherman's wrist.

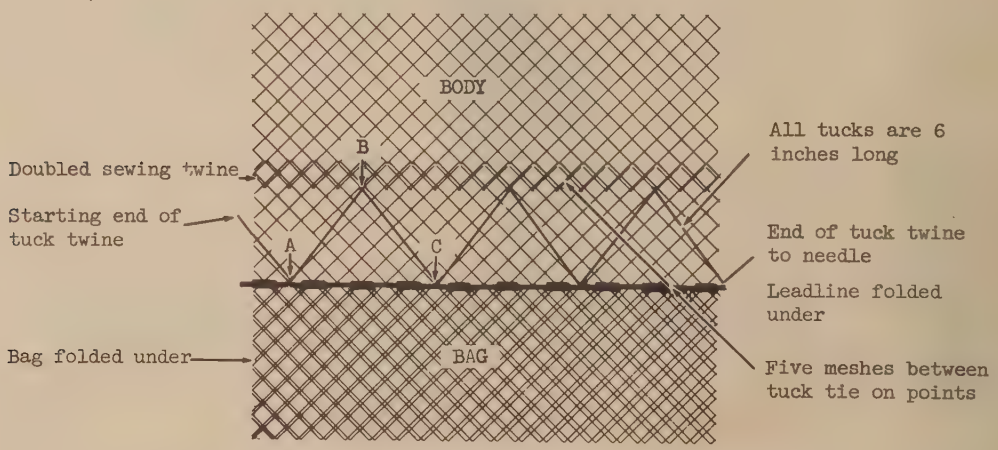
Sew the two ends of the bag netting together with No. 6 cotton twine, using figure 7 as a guide. (Make sure there are no twists in the netting before sewing the ends together.) Now there is a tubular shaped piece of netting with the same number of meshes around as the perimeter of the disk of netting. The bag is now ready to be sewed to the body of the net. This is done with doubled No. 20/9 twine (fig. 8B).

After the bag is sewed on, the net is ready for hanging-in (attaching the leadline). How to hang-in the castnet is described in the English net construction section and figure 11.

The next and final step is to put the tucks in the net. First, suspend the net so that the leadline is at a convenient working height. For ease in working, instead of folding the perimeter of the net under, fold it up on the outside while the tucks are being placed. Now turn the net inside out. Fill the needle with No. 18-thread twine, and use figure 13 as a guide. This completes the construction of the Spanish net.

Unless a fisherman is experienced in cutting out tapered netting, it is very easy for him to make a mistake. For this reason a small amount of extra netting has been added for the gore net.

To prolong the life of a castnet, it should be washed and dried thoroughly after each use. It is also recommended that a netting preservative be applied to cotton netting.



Tie tuck twine on at point A, using a clove hitch, then leaving 6 inches of tuck twine, tie on at point B using a sheet bend, next comes point C and so on until all the tucks are attached. Tie the finishing end of the tuck twine to the starting end and the job is complete.

If the gore type net is used leave 6 meshes between the last two tucks.

Figure 13.--Method of putting the tucks in a Spanish net.

Figure 14.--Spanish net.

Figure 15.--English net.

SUMMARY

Catching fish with a castnet dates back many years and continuously increases in popularity. It takes a considerable amount of time to master the ancient art of hand knitting these nets. The methods of constructing a disk of netting described in this publication are fairly simple and easy to follow.

Since most commercial fishermen suppliers stock the necessary materials needed to fabricate a castnet of machine knitted netting, the fishermen should have no difficulty obtaining them.

The most outstanding feature of castnets made of machine knitted netting is the relatively short period of time required to construct them.

Depth of water in the area to be fished is the deciding factor as to the style net; Spanish or English, best suited.

MS. #1463

Created in 1849 the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
WASHINGTON, D.C. 20240

OFFICIAL BUSINESS

Return this sheet to above address, if you do NOT wish to receive this material ☐, or if change of address is needed ☐ (indicate change).

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR